In the Claims

The following listing replaces all previous versions of the Claims.

We claim:

1. (canceled)

2. (canceled)

3. (currently amended) ~~A method as in Claim 1,~~ In a human-computer interface, a method of allowing a user of a haptic input device to affect the motion of an object in a computer application, comprising:

a) Establishing an object fundamental path representing a path of motion of the object in the computer application;

b) Establishing a device fundamental path in correspondence with the object fundamental path;

c) Detecting motion of the haptic input device;

d) Moving the object in the computer application along the object fundamental path responsive to a component of haptic input device motion along the device fundamental path; and

e) Applying a force to the haptic input device responsive to a component of haptic input device motion not along the device fundamental path; and

f) ~~further comprising a~~Applying a force to the haptic input device responsive to interaction of the object with the application.

4. (currently amended) A method as in Claim ~~1~~3, further comprising applying forces to the haptic input device corresponding to motion of the object in the application, wherein the forces provide a perception of momentum and inertia of the haptic input device corresponding to momentum and inertia of the object in the application.

5. (currently amended) A method as in Claim ~~1~~3, wherein the application comprises a plurality of states, and wherein the shape of the object fundamental path is dependent on the state of the application.

6. (currently amended) A method as in Claim ~~1~~3, wherein the application comprises a plurality of states, and wherein the shape of the device fundamental path is dependent on the state of the application.

7. (currently amended) A method as in Claim ~~1~~3, wherein the object interacts with the application, and wherein the interaction of the object with the application is dependent on the speed of the object along the object fundamental path.

8. (currently amended) A method as in Claim ~~1~~3, further displaying a visual representation of the object to the user.

9. (currently amended) A method as in Claim 8, wherein the visual representation when the haptic input device is on the device fundamental path is perceptively different from the visual representation when the haptic input device is not on the device fundamental path.

10. (currently amended) A method as in Claim ~~1~~3, further comprising:

a) Establishing a second object fundamental path representing a path of motion of a second object in the computer application;

b)　　Establishing a second device fundamental path in correspondence with the second object fundamental path;

c)　　Detecting motion of the <u>haptic</u> input device;

d)　　Determining if either device fundamental path is active, and if so, then

e)　　Moving the <u>first</u> object <u>if the first device fundamental path is active, or the second object if the second device fundamental path is active,</u> in the computer application along the active object fundamental path responsive to a component of <u>haptic</u> input device motion along the active device fundamental path; and

f)　　Applying a force to the <u>haptic</u> input device responsive to a component of input device motion not along the active device fundamental path.

11. (currently amended) A method as in Claim ~~1~~<u>3</u>, wherein the object comprises two representations, a visual representation that is used in a display to provide visual feedback to the user, and an interaction representation that is used with the <u>haptic</u> input device to provide force feedback to the user.

12. (currently amended) A method as in Claim ~~2~~<u>3</u>, wherein the force has a first magnitude for a first position of the <u>haptic</u> input device a first distance from the device fundamental path, and a second, larger magnitude for a second position of the <u>haptic</u> input device a second, larger distance from the device fundamental path.

13. (currently amended) A method as in Claim ~~1~~<u>3</u>, further comprising applying a force along the device fundamental path opposing motion of the <u>haptic</u> input device beyond an end of the device fundamental path.

14. (currently amended) ~~A method as in Claim 1.~~ <u>In a human-computer interface, a method of allowing a user of a haptic input device to affect the motion of an object in a computer application, comprising:</u>

<u>a)　　Establishing an object fundamental path representing a path of motion of the object in the computer application;</u>

<u>b)　　Establishing a device fundamental path in correspondence with the object fundamental path;</u>

<u>c)　　Detecting motion of the haptic input device;</u>

<u>d)　　Moving the object in the computer application along the object fundamental path responsive to a component of haptic input device motion along the device fundamental path; and</u>

<u>e)　　Applying a force to the haptic input device responsive to a component of haptic input device motion not along the device fundamental path; and</u>

f)　　~~further comprising a~~<u>A</u>pplying a force to the <u>haptic</u> input device to urge the <u>haptic</u> input device to a starting region of the range of motion of the haptic input device<u>, where the starting region comprises a region of the range of motion of the haptic input device such that motion of the haptic input device along the device fundamental path starting in the starting region will not require motion of the haptic input device outside its range of motion.</u>.

15. (currently amended) A method as in Claim ~~1~~<u>3</u>, wherein the device fundamental path has a different shape than the object fundamental path.

16. (currently amended) A method as in Claim 1_5_, wherein the device fundamental path defines a curve in three-dimensions.

17. (currently amended) A method as in Claim 16, wherein the device fundamental path defines a curve in two-dimensions.

18. (currently amended) A method as in Claim 1_5_, wherein the device fundamental path defines a surface in three-dimensions.

19. (currently amended) A method as in Claim 4_3_, wherein a characteristic of the object in the application is responsive to motion of the haptic input device off the device fundamental path.

20. (currently amended) A method as in Claim 1_9_, wherein the force resists motion of the haptic input device off the device fundamental path along a first dimension, and wherein a characteristic of the object in the application is responsive to motion of the haptic input device off the device fundamental path along a second dimension different from the first dimension.

21. (currently amended) A method as in Claim 4_3_, wherein the magnitude of the force is partially dependent on the position of the object along the object fundamental path.

22. (currently amended) A method as in Claim 4_3_, wherein the magnitude of the force is partially dependent on interaction of the object with the application.

23. (currently amended) A method as in Claim 4_3_, wherein the magnitude of the force is partially dependent on a user-assistance parameter of the interface.

24. (original)   A method as in Claim 23, wherein the user-assistance parameter is established by a measure of the user's proficiency in manipulating the input device.

25. (currently amended) A method as in Claim 1_4_, additionally comprising:

a)   Defining a motion-initiation region comprising a portion of the haptic input device range of motion;

b)   Determining when the haptic input device is within the motion-initiation region; and

c)   When the haptic input device is within the motion-initiation region, applying a force to the haptic input device urging the haptic input device to the device fundamental path.

26. (currently amended) A method as in Claim 4_3_, wherein establishing a device fundamental path comprises:

a)   Determining when the user supplies a motion-initiation signal; and then

b)   Establishing a device fundamental path according to a defined device path and the position of a cursor controlled by the user when the motion-initiation signal was supplied.

27. (original)   A method as in Claim 26, wherein the motion-initiation signal comprises motion of the cursor to a defined range of the cursor's range of motion.

28. (original)   A method as in Claim 26, wherein the motion-initiation signal comprises a switch actuated by the user.

29. (original)   A method as in Claim 27, wherein the motion-initiation signal further comprises detection of the position of the cursor in a defined range of the cursor's range of motion when the switch is actuated.

30. (currently amended) A method as in Claim 26, wherein the motion-initiation signal comprises motion of the haptic input device having defined characteristics.

31. (currently amended) A method as in Claim ~~13~~ 3, wherein:

a)   The computer application comprises a golf simulation;

b)   The object comprises a golf club; and

c)   The object fundamental path comprises a path suited for perception of the swing of a golf club; and

d)   Applying a force to the haptic input device responsive to interaction of the object with the application comprises applying a force to the haptic input device responsive to interaction of the object with other objects in the application.

32. (currently amended) A method as in Claim ~~13~~ 3, wherein:

a)   The computer application comprises a pool simulation;

b)   The object comprises a pool cue; and

c)   The object fundamental path comprises a path suited for perception of the motion of a pool cue.

33. (canceled)

34. (new)   A method as in Claim 15, wherein the correspondence between the device fundamental path and the object fundamental path is not one to one.

35. (new)   In a computer presentation of the interaction of objects simulating physical objects, a method of allowing a user to use a haptic interface device to control the motion of a defined object of such objects, comprising:

a)   Establishing an object fundamental path representing a path of motion of the defined object in the computer application;

b)   Establishing a device fundamental path in correspondence with the object fundamental path representing a path that can be followed by the haptic interface device;

c)   Detecting motion of the haptic interface device;

d)   Moving the object in the computer application along the object fundamental path responsive to a component of haptic interface device motion along the device fundamental path; and

e)   Applying a force to the haptic interface device responsive to a component of input device motion not along the device fundamental path.

36. (new)   A method as in Claim 35, further comprising applying a force to the haptic interface device responsive to interaction of the object with another object in the computer presentation.

37. (new)   A method as in Claim 35, further comprising:

f)   accepting a signal from the user indicating that a path interaction is desired, and, when said signal is accepted, then moving the object according to d) and e);

g)   accepting a signal from the user indicating that a path interaction is not desired, and, when said signal is accepted, then moving a cursor in the computer presentation corresponding to motion of the haptic interface device.

38. (new)   A method as in Claim 31, wherein the object fundamental path and the device fundamental path have different shapes.